b-jet tagging with secondary vertex finding

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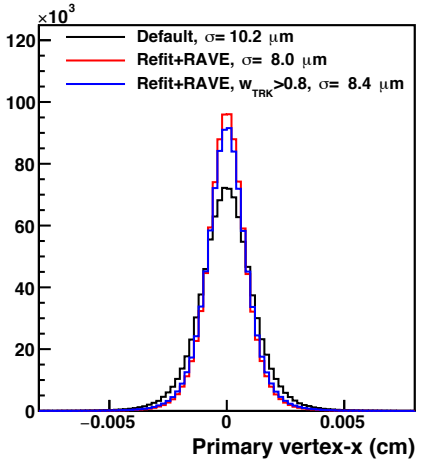
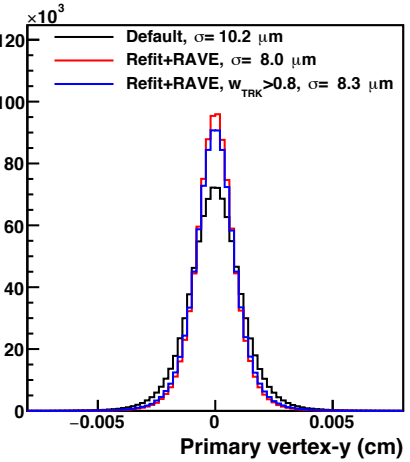
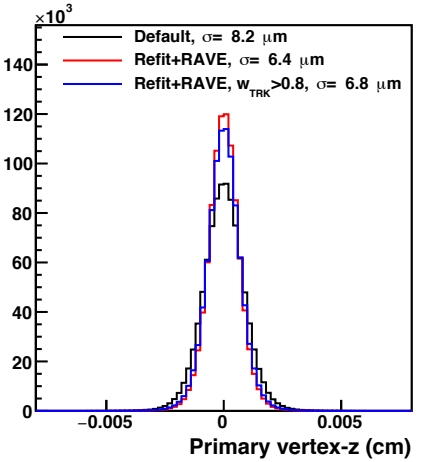
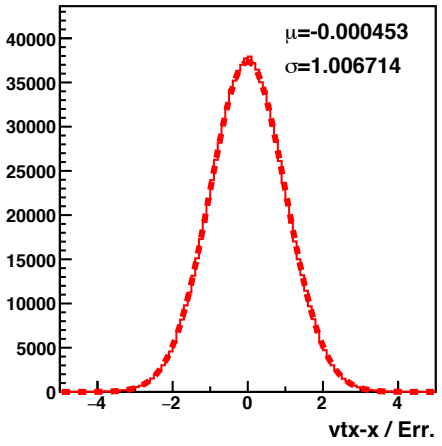
Primary vertex resolution in p+p

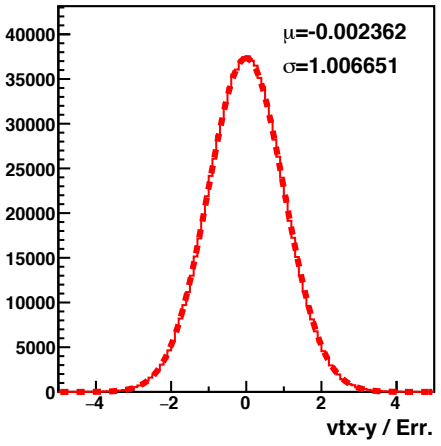
- Update on tracking efficiency
  - Slightly better primary vertex resolution (RED) then default (BLK)
  - Vertex / error is Gaussian distribution with sigma=1

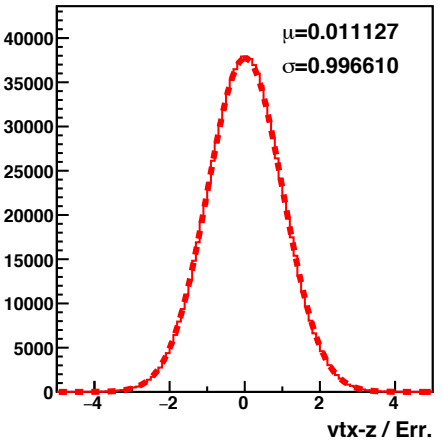








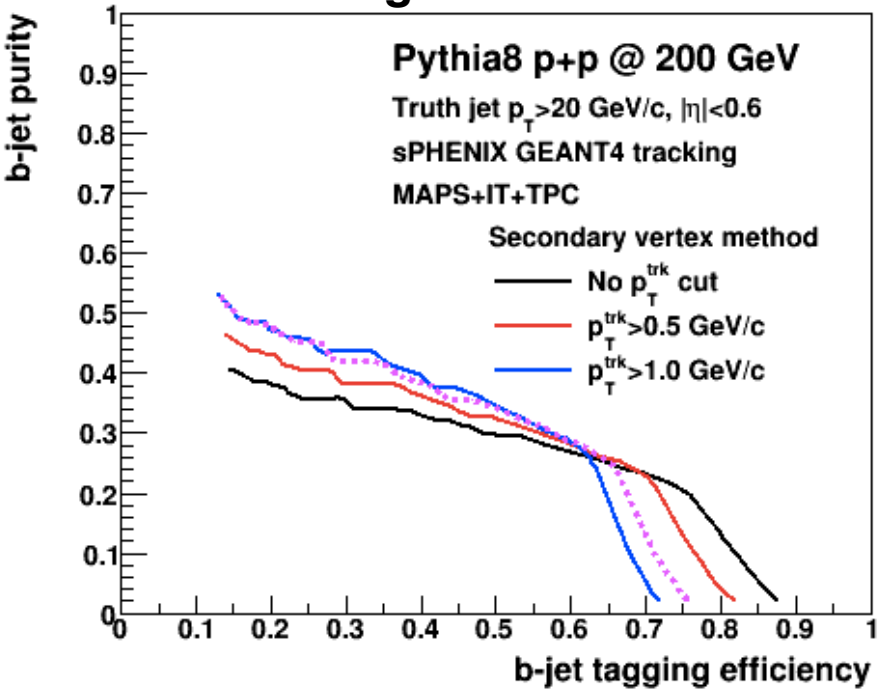




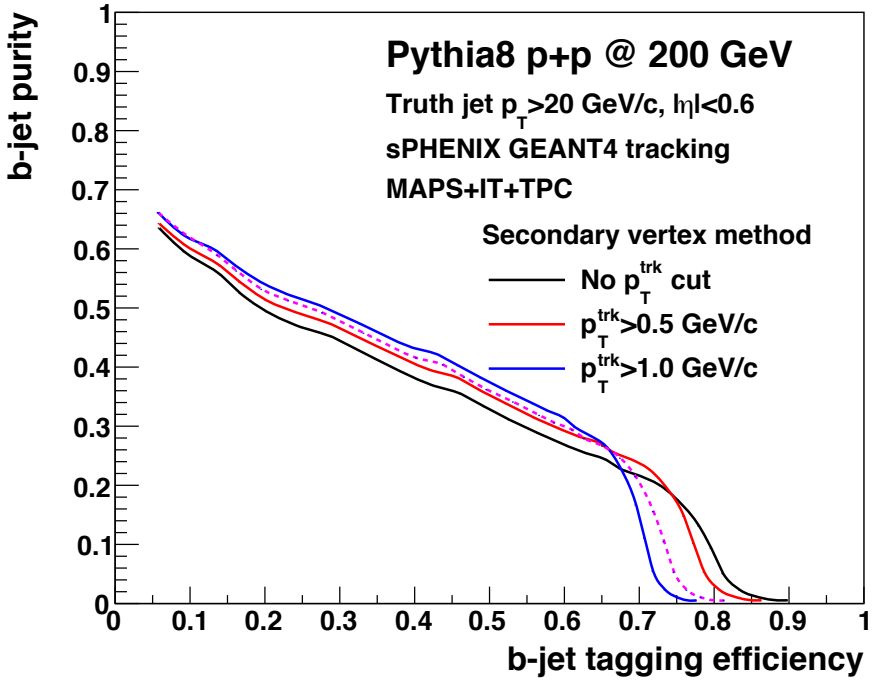
b-jet purity vs. efficiency

- Update on tracking efficiency
  - Re-evaluate b-jet purity vs. efficiency (MAPS+INTT+TPC, MAPS: Cylinder)
  - Improved with the updated tracking

old tracking

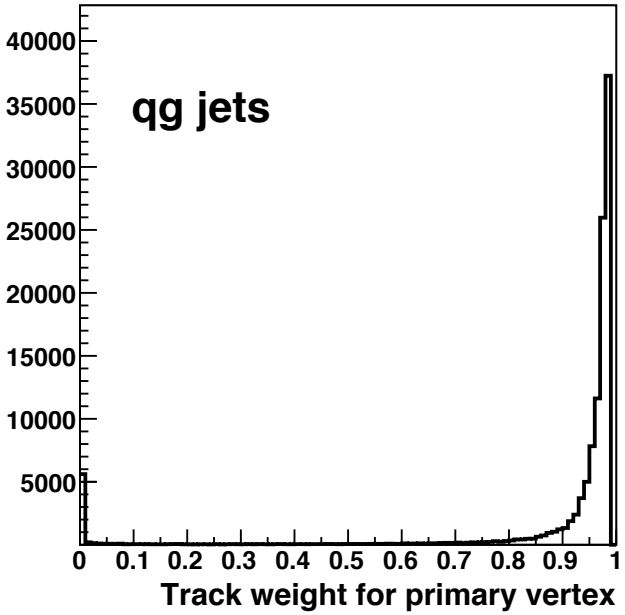


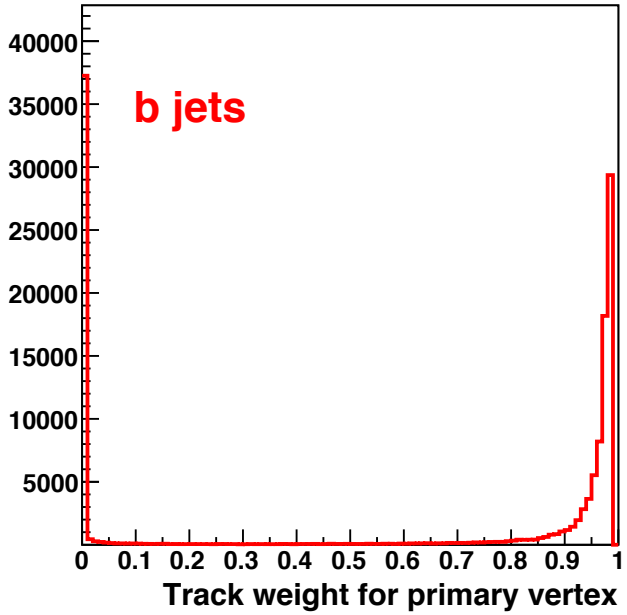
new tracking



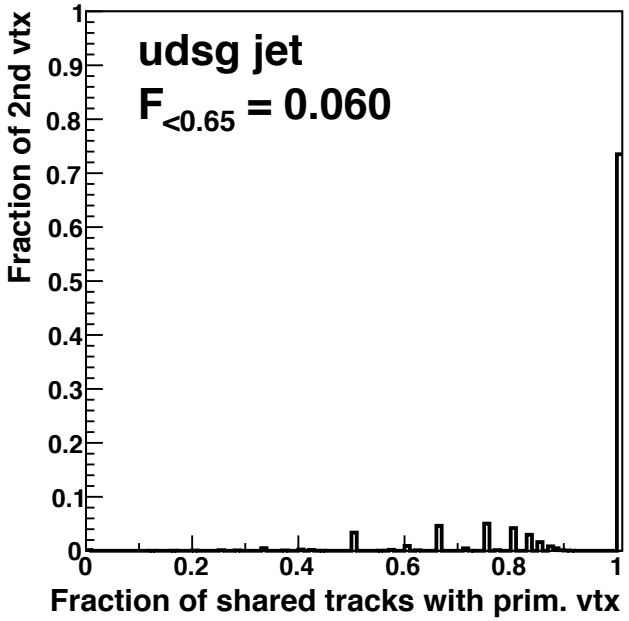
Magenta lines represent 2nd vertex p_T/jet p_T>0.15

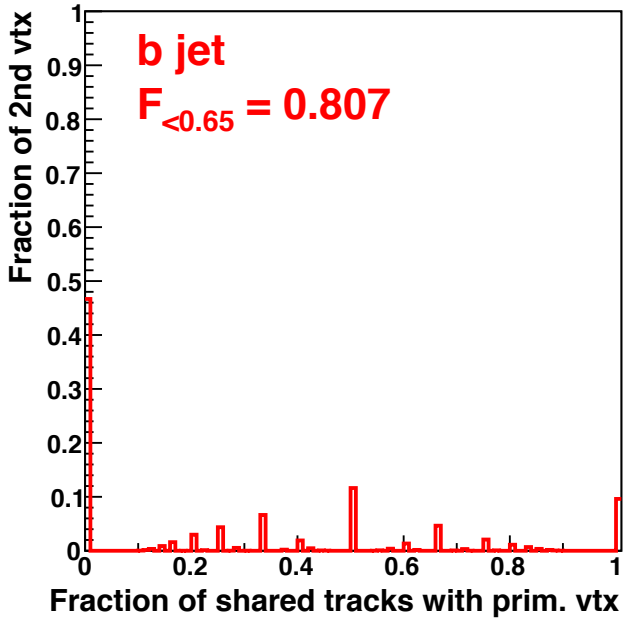
- Based on the study from CMS, checked the fraction of shared tracks between the primary and secondary vertices.
  - Large fraction of tracks in events containing b-jets are de-weighted for primary vertex finding
  - No change in primary vertex resolution with tracks of w>0.8 (BLUE in pg. 2)





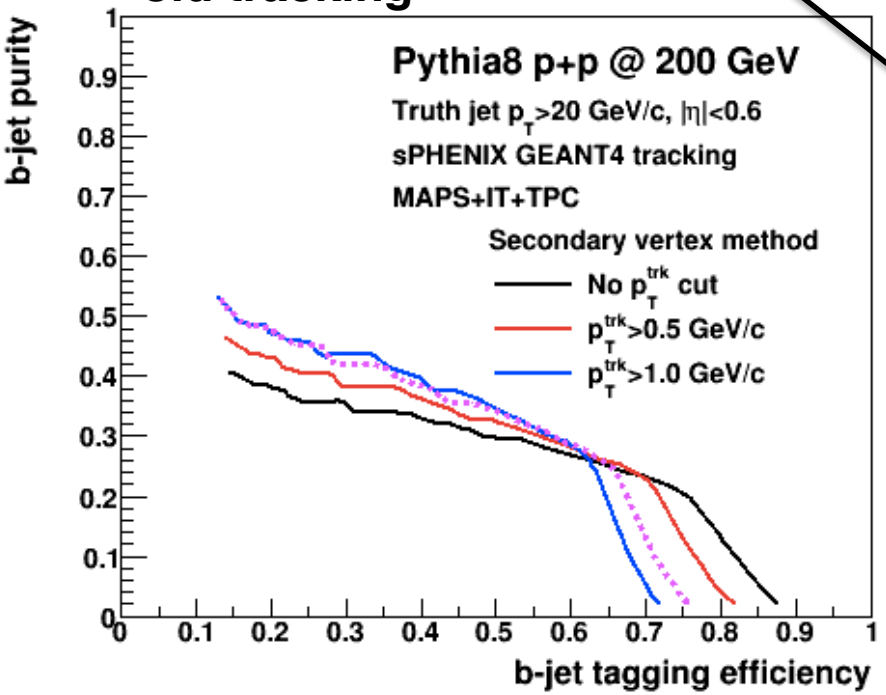
- Based on the study from CMS, checked the fraction of shared tracks between the primary and secondary vertices.
  - Large fraction of tracks in events containing b-jets are de-weighted for primary vertex finding
  - No change in primary vertex resolution with tracks of w>0.8 (BLUE in pg. 2)
  - Large fraction of shared track with prim. vtx (tracks of w>0.8) in case of udsg jet (Reject >0.65 – can be tuned)



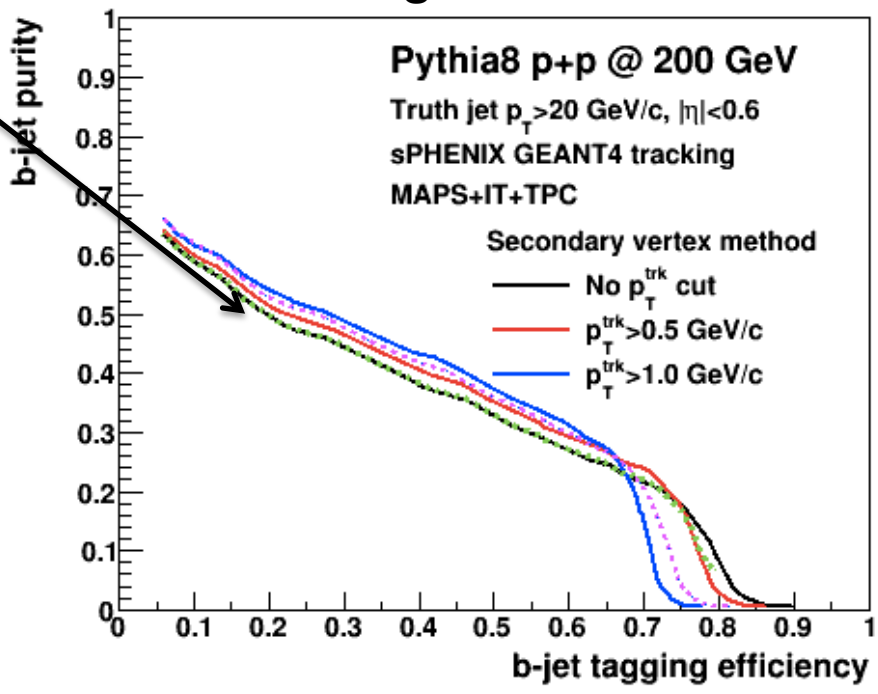


- Update on tracking efficiency
  - Re-evaluate b-jet purity vs. efficiency (MAPS+INTT+TPC, MAPS: Cylinder)
  - Improved with the updated tracking
  - Similar performance with the cut of fraction of shared track

old tracking



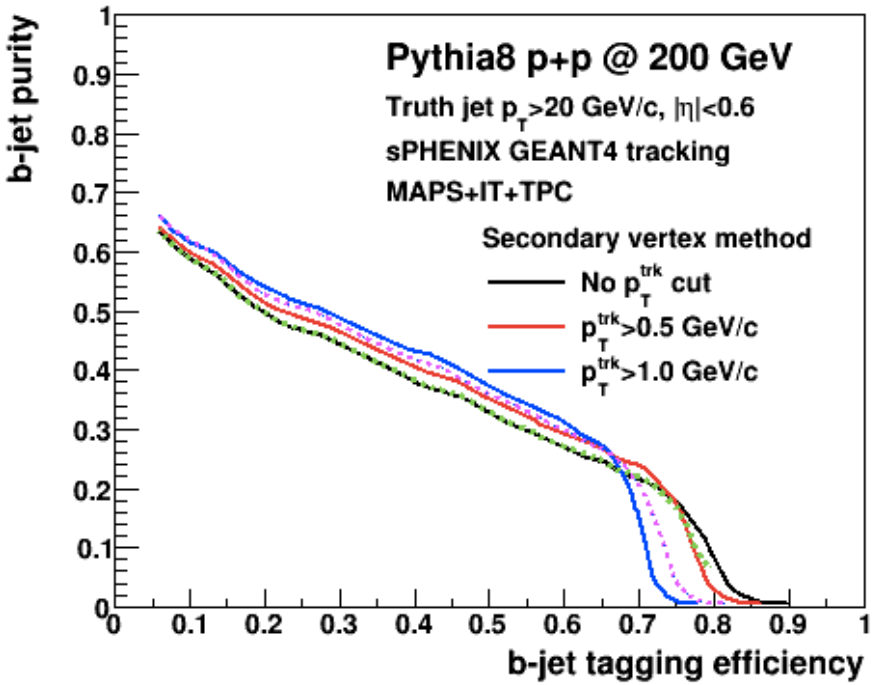
new tracking

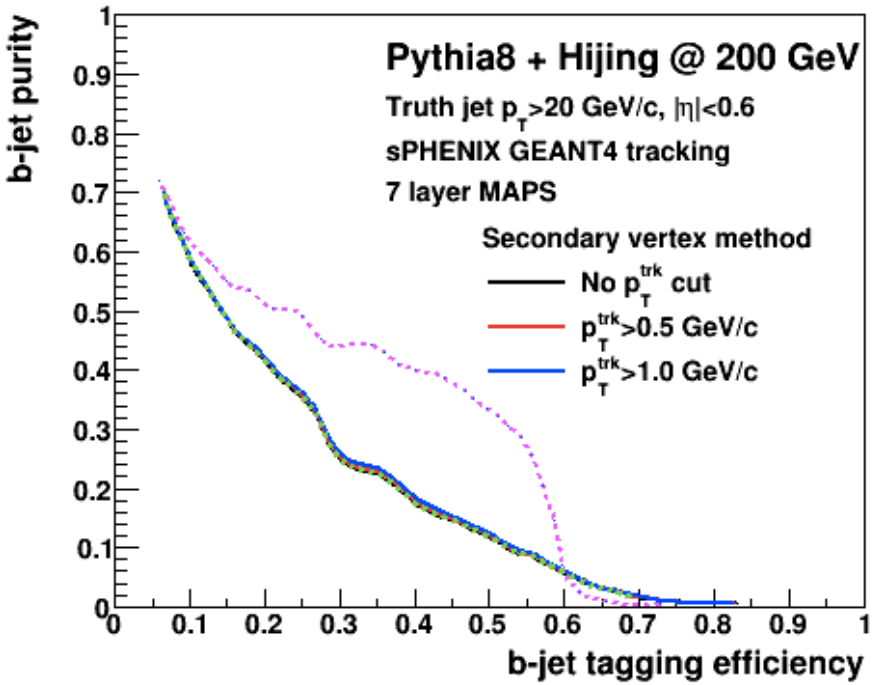


Magenta lines represent 2nd vertex p_T/jet p_T>0.15

First look on embedding simulation

- 7-layer MAPS configuration
  - Use same tagging methods/cuts for p+p
  - Vertex p_T/Jet p_T cut looks better than others





Magenta lines represent 2nd vertex p_T/jet p_T>0.15
Green lines represent 2nd vertex fraction of shared track w/ prim. vtx<0.65